



Technology Demonstration Summary Sheet Mobile Automated Characterization System (MACS)?

THE NEED

Radiological surveys are performed to quantify the amount and extent of radioactive contaminants. Manual surveys performed with portable instruments are the current baseline technology for floor contamination characterization and periodic radiological condition surveys. Surveys of large floor areas or repeated manual floor surveys are time-consuming and tedious, resulting in the potential for inaccuracy due to an operator's inattention. An automated system provides an alternative which should provide more accurate and reliable data which can be archived automatically.

THE TECHNOLOGY

The Mobile Automated Characterization System (MACS) has been developed by Oak Ridge National Laboratory and the Savannah River Technology Center for the U.S. Department of Energy's Robotics Technology Development Program to address this need. MACS is a commercially-available, battery-powered, autonomous robot base supplemented by a laser positioning system and a scintillation detector array. MACS can detect alpha and beta contamination, and moves over floors at a speed of one inch per second.



MACS in Operation at the CP-5 Facility

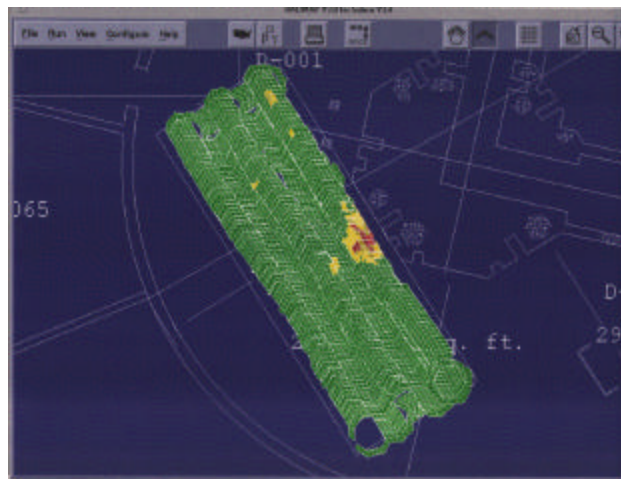
THE DEMONSTRATION

MACS was demonstrated in July 1996 for the first time in a nuclear facility at Argonne National Laboratory's CP-5 reactor as part of the CP-5 Large Scale Demonstration Program funded by DOE's Federal Energy Technology Center. The test area for the demonstration was a concrete

area on the service floor of CP-5, where portions of the floor contained fixed contamination. Contamination levels measured by baseline manual surveys ranged from less than free release for beta to greater than 500,000 dpm beta per 100 cm².

THE RESULTS

Radiation levels and position data are represented as color coded shapes on the MACS user interface as indicated in the figure below. The blue area with white lines is a CAD representation of the CP-5 service floor. The predominately green area represents the survey area and areas of lower contamination (below or near unrestricted release limits). Yellow and red areas represent progressively higher areas of contamination.



Measurement Results of CP-5 Reactor Service Floor

CONTACTS

- Dick Baker, Project Manager, U.S. Department of Energy, Chicago Operations Office, (630) 252-2647.
- Steve Bossart, D&D Focus Area Manager, Federal Energy Technology Center, (304) 285-4643.
- Terry Bradley, Alliance Administrator, Duke Engineering & Services, (704) 382-2766.
- Mike Coffey, Test Engineer, Argonne National Laboratory, (630) 252-4315
- Dennis Haley or Brad Richardson, Oak Ridge National Laboratory, (423) 576-4388.